

**CLAIMS**

1. A bulk material analyser for analysis of bulk material on a conveyor belt passing through the analyser between a radiation source and a radiation detector, said analyser including a generally C-shaped housing extending  
5 around an open-sided aperture for passage of said belt, said housing being substantially filled with radiation shielding material to provide radiation shielding around said aperture, and a removable block of radiation shielding material to close the open side of said aperture and provide surrounding radiation shielding of said aperture.
- 10 2. A bulk material analyser as claimed in claim 1 wherein a moderator insert is fitted into said aperture to at least partially define a conveyor passageway.
3. A bulk material analyser as claimed in claim 2 wherein said removable block of shielding material includes an inner portion of moderator material that also partially defines the conveyor passageway.
- 15 4. A bulk material analyser as claimed in claim 2 or claim 3 wherein a radiation source is disposed within the moderator insert.
5. A bulk material analyser as claimed in claim 4 wherein a radiation detector is located in the shielding on the side of the aperture remote from said source.
- 20 6. A bulk material analyser as claimed in any one of claims 2 to 5 wherein said moderator insert and removable block of shielding material combine to form a flat bottomed V-shaped passageway for the conveyor belt.
7. A bulk material analyser as claimed in any one of claims 2 to 6 wherein said moderator insert is surrounded by radiation shielding material on all sides.
- 25 8. A bulk material analyser as claimed in claim 6 wherein said moderator insert includes a rectangular block of secondary neutron moderator positioned below said V-shaped passageway.

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9. A bulk material analyser as claimed in claim 8 wherein said block of secondary neutron moderator includes an insert of primary neutron moderator.
10. A bulk material analyser as claimed in claim 8 or claim 9 wherein said moderator insert includes a triangular block of secondary neutron moderator defining one side of said V-shaped passageway.
11. A bulk material analyser as claimed in claim 10 wherein inner portion of moderator material of said removeable block is a triangular block of secondary neutron moderator.
- 10 12. A bulk material analyser as claimed in any one of claims 1 to 11 wherein said shielding material is cast neutron shielding.
13. A bulk material analyser as claimed in claim 12 wherein the cast neutron shielding is substantially 60% Polyethylene Beads by weight, 20% Borax by weight and 20% Polyester Resin by weight.
- 15 14. A method of assembly of a bulk material analyser for analysis of bulk material on a conveyor belt passing through the analyser between a radiation source and a radiation detector, said method including the steps of forming a generally C-shaped housing around an open-sided aperture for passage of said conveyor belt, and substantially filling said housing with fluid radiation shielding material to provide a radiation shielding around said aperture.
- 20 15. A method as claimed in claim 14 wherein the radiation shielding is cast neutron shielding poured into the housing as a liquid in a sequence of steps including (a) filling a first portion of the base of the housing with cast neutron shielding; (b) positioning a moderator insert and filling a second portion of the housing with cast neutron shielding; and (c) fitting the radiation detector assemblies to the upper portion of the housing and
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making a further pour of cast neutron shielding to substantially fill the housing.